INDIAN KNOWLEDGE SYSTEM AND ANCIENT MATHEMATICS

KAMAL KISHOR
SSJDWSSS GOVERNMENT POST GRADUATE COLLEGE, RANIKHET,ALMORA (UTTARAKHAND)
SHANKAR KUMAR
SSJDWSSS GOVERNMENT POST GRADUATE COLLEGE, RANIKHET,ALMORA (UTTARAKHAND)

Abstract: The study of mathematics in india is from vedic era, and Indian mathematics has its roots between 1000 B.C. to 1800 A.D. Evidence of concept of zero, numeral system, technique of algebra and algorithm, square root and cube root are found in Vedas. Indian knowledge system is based on vedic literature, Vedas and Upnisada. There will be encouragement for innovation with the help of ancient literature. In IKS through grand National Challenges, National Competition, Hackathons, Innovations. Employment opportunities for youth through skill-based programmes will be created. IKS will promote heritage technology by bringing technology solutions to showcase the Indian heritage to Indians and the world.

Key Words: Vedic Mathematics, Indian Vedic Education, NEP 2020, Upnishada ,Vedas.

Introduction: Systematic transmission of knowledge from one generation to next generation is main objective of present IKS. With the help of ancient mathematics, vedic ganit we can solve easily to mathematics operation in topics on Arithmatic, Algebra, Plane Trigonometry, Continued fractions, Quarderatic Equations, sums of power series and a table of sines. The Indian knowledge system comprise of gyan vigyan and jeewan darshan that have evolved out of experience ,observation ,experimentation and rigorious analysis. IKS includes knowledge from ancient india and its successes and challenges, and a sense of Indians future aspirations specific to education, health, environment and indeed all aspects of life.

The main objective of IKS is to promote interdisciplinary research.

Evidence of Mathematics, Directly from Ancient India: Number evidence were found in Rgveda, The famous dictum of Rgveda 'Ekam Sad Vipra Bahuda Vadanti' uses 'ekam' means 'one' as a cardinal number.

SULBA SUTRA helped in study of structures and helpful in measurement. 'Sulba' words refers to 'Rope' and 'Sutra' means 'Formula'. Thus SULBA SUTRA means 'formulas of measurements' which basically means geometry. Their origin can be traced to vedas.

ARYABHATIYA provides summary of in his time covering topics on Arithmatic, Algebra, Plane Trigonometry, fractions, Quardaratic equations, Sums of power series.

PANINI (6^{th} C, B.C.) Provides formal production rules and definitions in his ASTAADHYAYI, which helped in scientific theory of phonetic, phonology, and morphology. Present definition of mathematical function can be comparable to Panini`s constructions.

MAHAVIR ACHARYA of Mysore in 9^{th} century wrote GANIT SAAR SANGRAH, where he described the currently used methods of calculating the least common multiple (LCM) of given numbers. IN 9^{th} century SRIDHARA of Bengal provided mathematical formulae for a variety of practical problems involves Ratios, Barter, Simple interest, Mixtures, Purchase and sale, Rates of travels and wages.

Indian Knowledge System and NEP 2020 : Indian knowledge system , ancient culture and education has rich diversity .The proposal in NEP 2020 includes tribal knowledge and as well as indigenous and traditional learning methods which will cover and include mathematics ,astronomy, philosophy , yoga , architecture , medicine ,agriculture ,engineering ,linguistics ,literature ,sports games as well as governance ,polity and conservation .Specific courses in tribal ethnomedicinal practices ,forest management ,traditional (organic) ,crop cultivation ,natural farming etc. will also be made available .An engaging course on Indian Knowledge System will also be available to students in secondary school as an elective .

In mathematics under NEP 2020 various courses like Vedic mathematics and its application are being taught to college students as a elective or a main subject to introduce traditional mathematics to the students.

Vedic Mathematics And IKS: Govt has implemented vedic mathematics as a compulsory or elective course in higher education to ancient formulas and sutras to present generation under NEP 2020. By using 16 formulas called SUTRA and 14 UPSUTRA of vedic mathematics the basic mathematical operations can be solved easily. The verses are companion to revolve delicate sum totals into quick internal mathematics applying simple rules. The sutra "NIKHILAM NAVATASHCHARAMAM DASHATAH" of vedic mathematics said – "all from nine, last from ten". For example to multiply 68 by 72, the numbers are broken into (70-2) and (70+2) and the square of the smaller sum (4) is substracted from the square of larger (4900) to reach the answer 4896.

Conclusion: In summary Indian knowledge system is working as a bridge between our Indian culture and ancient rich diversity of our education system to present education system. Vedic mathematics sutra and upsutra are very helpful for basic operations and as well as for simple calculation ,ancient mathematics has its vital role in astronomy, astrology, calendrical studies, geometry, constructional geology etc. Indian knowledge system will not only promote our traditional methods but also helpful in developing an awareness and appreciation of indias diversity, culture and traditions, as well as knowledge of various aspect of the nation. IKS centre in institutes will act as a catalysts for research, education, and outreach activities.

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